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ABSTRACT

A group of 119 children in Sweden were followed from infancy to age 8 to determine the relationship between type of child care children received and their later development. At the age of 8, children were given aptitude tests and were rated by teachers on school performance and social and personal development. A number of background variables were also considered. Results showed that, in most aspects, type of child care had an independent explanation power for children's cognitive and social development. However, the group of children who were placed in day care during their first or second year of life and remained there until the start of school, was generally rated more favorably by teachers and performed better on aptitude tests than all other groups. Some relationships between type of child care and family type were found, and the mother's satisfaction with the child care was found to be an important prediction variable. A 21-item reference list concludes this document. (PCB)

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Bengt-Erik Andersson

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Stockholm Institute of Education
Department of Educational Research

Home Care or External Care? -
A Study of the Effects of Public Care
on Children's Development When 8 Years Old

STOCKHOLM INSTITUTE OF EDUCATION
Department of Educational Research

Reports on Education and Psychology No. 2, 1986

Bengt-Erik Andersson

HOME CARE OR EXTERNAL CARE? -
A STUDY OF THE EFFECTS OF PUBLIC CHILD CARE ON CHILDRENS DEVELOPMENT WHEN 8 YEARS OLD

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ABSTRACT

Andersson, B-E. HOME CARE OR EXTERNAL CARE? -A STUDIE OF THE EFFECTS OF PUBLIC CHILD CARE ON CHILDRENS' DEVELOPMENT WHEN 8 YEARS OLD. Reports on Education and Psychology, Department of Educational Research, Stockholm Institute of Education, No. 2, 1986. 57 pages.

In Sweden around 80% of mothers with children below school age, i.e. below the age of 7, work part-time or full-time outside home. This means a great demand for public child care for this age group.

A group of 119 children have been followed from their first year of life up to the age of 8. Each year data about their present kind of day care were collected.

The children were divided into 3 and 5 groups respectively, according to type of day care they had experienced during their first 7 years of life. The first grouping into 3 groups only considered the amount of experience of day care centers children had. The later grouping also took into consideration other kinds of day care. It resulted in the following groups:

1. Early center care. The children were placedat a day care center already during their first or second year of life and stayed their until school start.
2. Late center care. The children entered a day care center at a later time.
3. Mixed care. The children were first placed in family day care and later at a center.
4. Family day care, and 1-2 years of part-time kindergarten.
5. Home care, and 1-2 years of part-time kindergarten.

At the age o 8 the children were tested with aptitude tests and rated by their school teachers concerning their school performance and their social and personal development.

In the data analyses the predictive power of type of child care and several other ecological background variables have been studied for children's later development. The other background variables included socio-economic status, mother's educational level, family type (one or two parents) and sex of child. Two methods were used - stepwise regression (with children divided into 3 groups) and MCA-analyses (with children divided into 5 groupsa). The analyses supported each other and gave about the same result patterns.

In short the results showed that in most aspects type of child care had an independent explanation power for children's cognitive and social development. One group differed markedly from the other groups, namely the early center group. The children in this group were generally rated more favorably than children in any of the other groups. They also performed better on the aptitude tests. Some interactions effects between type of child care andfamily type were also found. In addition mother's satisfactionwith the type of child vare the family had turned out to be an important prediction variable.

Key words: Public child care, daycare centers, family day care, home care, cognitive development, socio-emotional development, longitudinal study, 8-year-olds.
Research

Research supported by: The National Board of Education, The Band of Seden Tercentenary Foundation, The Deletation for Social

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The FAST-project is performed in cooperation between the Department of Educational Research, Stockholm Institute of Education and the Department of Educational Research, University of Göteborg.

Project leaders are: Professor Bengt-Erik Andersson, Stockholm and Ph. D. Lars Gunnarsson, Göteborg.

The FAST-project has also been part of the International Group for Comparative Human Ecology which was established in 1976. Five countries formed a working group : Germany, Israel, Sweden, the United States and Wales. At the time the group was formed the scientific leaders in each country were Rudolf Fisch and Kurt Lüscher (Germany), Sophie Kav-Venaki and Ron Shouval (Israel), Bengt-Erik Andersson (Sweden), Ronald Davie (Wales) and Urie Bronfenbrenner, Moncrieff Cochran, and William Cross (U.S.A.). These five national research teams have worked cooperatively on concepts, instuments and research methods. The international group has as one of its goal the cross-cultural comparison of data related to the ecology of human development.

The data reported on here, however, come exclusively from the Swedish project, in which we have followed a group of families for several years and done extensive data collections every year. I want to thank all the families for their kind cooperation and patience. I also want to thank all my coworkers who have done the data collection and coding of the material. Several persons have read an earlier version of this report and given me valuable comments: Moncrieff Cochran, Ingemar Emanuelsson, Ulla Kihlblom, Karin Sandqvist, and Gertrud Schyl-Bjurman.

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The project has been supported by The National Board of Education, The Bank of Sweden Tercentenary Foundation, The Delegation for Social Research, the Lilly Foundation, and The Spencer Foundation.

In modern societies child care for young children is a burning issue for many families. In Sweden, for instance, around 80% of mothers with children under school age* work part-time or full-time outside home. Under such circumstances most of them have to find a suitable care arrangement for their children while they work. Sometimes they can go in shifts with their husbands and do not need help from others, sometimes a relative or close friend can assist, but most families in Sweden need support from the public day care system. The child can either be placed in family day care or at a day care center.

One can say that a society like Sweden is dependent on a good and effective day care system. At the same time there is an ongoing debate on what is best for children. Can a mother with good conscience leave her one or two year old child at a day care center or day nurcery for, say 8 or 9 hours a day or should society make it economically possible for her to stay home until the child is at least three years old?

The debate is based not so much on what we know about the effects on children of various forms of day care as on what we believe is good for children and on what we think is best for the mothers. The last aspect is associated with the strivings for equality between sexes - a question given high priority in the Swedish society. If women stay home too long and take care of the family's children their possibilites to maintain their position on the labor market and compete with men will deteriorate.

There are several ways to counteract these tendencies. One is to encourage also men to stay home and take care of their young children. This is now part of the general policy in Sweden. One

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* In Sweden children start school at age 7.

of the parents in families with newborns can stay home from job for nine months with their salaries paid by the social insurance system and some additional months with a minimum sum paid by the insurance. The parents can divide the months between them as they prefer. Even if mothers still make use of the major part of the available time more and more fathers take the opportunity to stay home for at least one or two months while the children are below the age of one.

Another way is to expand the public day care and this is also a process that has going on for many years now. In Sweden some 42-45% of children under school age have a place in public child care - 26% in a day care center and the rest in family day care - which is less than the actual demand for places.

When it comes to what is best for children many people seem to believe that young children under the age of three should stay home, while older children may benefit from the kind of group experience which is offered in day care centers. The critics of group day care for young children often refer to theories of attachment and object relation and stress the danger of emotional disturbances. And it is true that young children initially can show signs of distress or even depression when placed at a day care center. This is shown by Hårsman (1984, 1986) in a study of 26 infants (6-12 months old). They were studied 4-5 times during their first five months at the center and at home and compared to a similar home group. After about two months the children started to recover and after five months the differences on group level were quite small. However, she also found a significant difference in favor of the home group on the Personal-social sub-scale of Griffith's Mental Development Scale, which could be a sign of intensified attachment behavior. Hårsman also found signs of temporary inhibition of the verbal development. One interpretation of the

results is that early placement at a day care center expose the children to stress and make demands on their adaptability but they tell us nothing about long-term effects neither negative nor positive.

One important result from Hårsman's study is the great individual differences she found. Some children recovered very quickly while others were still somewhat depressed at the end of the observation period.

The study is an example of the type of studies which concentrate on the effects of early separations between the young child and its parents. Based on analytic theories and with support from studies of longer separations when children are placed in institutions or hospitals for weeks or months one has assumed that even daily separations from parents when the child is left at e.g. a daycare center can be damaging for the emotional development.

This is, however, not in accordance with recent research results. Several reviews of existing research have been published (e.g. Belsky & Steinberg, 1978; Bronfenbrenner, 1976, 1979; Cochran & Gunnarsson, 1984; Haskins, 1985; Rutter, 1981) and it is easy to agree with Belsky's and Steinberg's conclusion that the results could be summarized very briefly. For the emotional development there is no conclusive evidence showing that the emotional ties or attachment to parents are disturbed by relatively early placement at a nurcery or that the child should prefer somebody else instead of the mother (Belsky & Steinberg, 1978). Rutter (1981) is somewhat more cautious in his conclusions. He agrees that a high quality child care has not showed any substantial effects, but says:

"It would be wrong to conclude that day care, any more than

> home care, is without effects, and it would be misleading to assume that it carries no risks (even though these have been greatly exaggerated in the past)" (op cit p 21).

According to Rutter effects - good as well as bad - depends on a number of circumstances having to do with the contents and quality of the care but also with conditions in the home environment of the child.

Studies of the children's cognitive development like those of emotional development have failed to support both the critics and the advocates of public child care. There are some evidences, however, showing that for children from high-risk environments the cognitive decline often found could be attenuated if they get center-based care (Belsky & Steinberg, 1978).

When it comes to the social development there is one effect found in several studies, namely that children in group care are somewhat more aggressive and assertive than other children, but even these results are ambiguous (Haskins, 1985). Belsky and Steinberg (1978) and Bronfenbrenner (1979) are inclined to interpret the aggressivity as an expression more of cultural values than of effects of group care. This is based on the fact that Gunnarsson (1978) in a Swedish study could not found any signs of increased aggressivity among children at day care centers.

To summarize, available research show very few dramatic effects in either positive or negative direction. If day care is of good quality it does not seem to matter very much which type of care parents choose. At the same time the results are difficult to interpret due to a number of factors. One is that the researchers very often refrain from giving a distinct definition

of what is meant by child care and different forms of child care can be grouped together, e.g. group care at day care centers and family day care or family day care and home care.

Another circumstance which makes it difficult to generalize the results is the varying content and quality represented in various studies. A number of them are done at experimental preschools of high quality and many at institutions associated to a university.

We also lack studies of long-range effects. Only a couple of studies have followed the children above the age of six and, so far as I know, only one up to the age of fifteen (Moore, 1975). The problem with that study, however, is that Moore grouped all children with care outside home into one group. Neither are we told how many years the children have had care outside home. This is typical for many studies. They do not specify the length of child care experience and the age of the child when first given child care outside home.

The present study differs somewhat from the general research design in the area. First, a time dimension is added meaning that focus is not only type of child care but also on the time of first enterance into day care. Secondly, the children have been followed for a fairly long time - from age 0 to 8. Thirdly the study has been performed in ordinary day care centers and family day care.

We have followed a group of children from their first year of life up to the age of 8. Every year we have recorded the kind of child care the family have used. On the basis of this information the children have been divided into five groups with various child care patterns. At the end of the first year in school (the year the children will be 8 years old) the school

teachers rated the children in a number of aspects concerning their cognitive and social competence, e.g. their school performance and various social and personality variables. The cognitive development was also measured by the help of aptitude tests.

The purpose is to study the effects of various types of child care on children's later cognitive, social and personal development.

Judging from earlier research findings the safest hypothesis would be that very small differences between various groups should be expected.

Before presenting the study, however, some information about the Swedish child care system will be given. The description relates to the time period covered by the study, that is 1976 to 1983.

Swedish Child Care

In Sweden child care with few exceptions is public and run by the municipalities. Central authority is the National Board of Health and Social Welfare. It can be organized in the form of day care centers or day nurseries or as family day care (so-called day-mothers or child minders). Other low frequent alternatives will not be treated here since they are not represented in the study.

The centers accept children from their first year of life up to school start. Normally the children are grouped in two age groups - one for young children up to the age of 2 or 2 1/2 and

one for older children, so-called sibling groups. Sometimes all ages are grouped together. The staff consists of both child nurses with a two years training after compulsory school and preschool teachers with 2 1/2 years of training after the gymnasium at a teacher college. The aim is not only to provide care but also to give educational stimulation. By tradition the stimulation of social and personal development has been considered as most important while the intellectual development and the preparatioon for school has come second. This has been critizised and in the new preschool program developed by the National Board of Health and Social Welfare the cognitive aims have been emphasized. However, it is fair to state that the educational situation in many centers has been rather unstructured.

The preschool groups consists of about 12 children in the younger groups and 15-16 in the older ones. The staff/child ratio is around 1:4 and 1:5 respectively. The material standard is very high with a lot of space and equipment. Even if there are differences between various preschools it is probably safe to assume that standard, contents, and activities are more homogenous in Sweden and in other Scandinavian countries than in many other countries.

The day-mothers are hired by the municipalities. They are encourage to participate in short courses for day-mothers. The system with public day-mothers increase the security for both day-mothers and parents. The day-mothers get paid even when a child is sick and the municipality provides a substitute if the day-mother is ill. They also get paid vacations.

Since there is a shortage of preschools and day-mothers some families try to find private day-mothers. We have a few in our sample. Sweden is constantly increasing the places in public

daycare. As mentioned, however, less than 50% of the children below 7 had public child care in 1986.

All children not in center care are by law offered place in a part-time kindergarten with the same educational goals as in day care centers the year before schoolstart (when they are 6). This offer is accepted by almost 100% of the families. That means that both children with day-mothers and children without day care outside home have at least one year of group training in kindergarten. It is therefore impossible to find a pure home group in Sweden with children without any group experience.

Methods

Sample

Four neighborhoods in Stockholm and four in Göteborg (Sweden's two largest cities) were chosen (Andersson & Rydén, 1979), representing low resource and middle resource areas. In each neighborhood families with a child around 3 1/2 years old were contacted in a random order and asked to participate in a longitudinal study. 128 families or 16 per neighborhood participated (2/3 two-parent families and 1/3 one-parent families). They were visited each year until the children were to leave the first grade in the compulsory school (the year they were to be 8). Data about the child care arrangement were collected for each year from the child's first year of life. At the end of the last year 119 families (92%) remained in the study.

On the basis of the children's various child care experiences

they could be divided into three or five groups respectively. When grouping the children into three groups the only criteria was their experience of day care centers. One group consisted of those children who were placed at a day care center already during their first or second year of life. Another group consisted of those children who entered a day care center at a later time. Some of them have had a day mother before entering the center. A third group consisted of those who never entered a day care center, but many of them have had day mothers. The distribution of children in the following:

Early center care	33	28%
Late center care	42	35%
No center care	44	37%

In classifying the children into five groups both the timing and the type of care arrangement were considered. The second and third group in the first grouping have both been split into two groups each and some adjustments were made in all groups to get them as clearcut as possible. That gave the following five groups.

Group 1 (<u>early center care</u>) consists of 33 children who were placed at a day care center already during their first or second year of life. The majority - more than 70% - had some form of child care during their first year of life; some had a day-mother but transfered to a center, but most entered the center from the beginning. In three cases the center care was interrupted for a shorter period - a year or so - but were resumed again, so most children had spent at least six years at a center, but not necessarily the same all the time.

Group 2 (<u>late center care</u>) consists of 21 children who entered a child care center later than the children in group 1 and who

only to a small extent had supplemented the center care with family day care. Five children had a day-mother for one year and two for two years before they entered the center, but the center care dominates. Two children had entered the center already during their second year of life but they stayed there only for two or three years. They have therefore been assigned to group 2 instead of group 1 where all children had at least four years center experience.

Group 3 (mixed care) consists of 16 children with experience of several years both with a day-mother and later at a center. 3/4 had been at least three years at a center and almost as many had had a day-mother for so long. 2/3 had had some form of day care already during their first or second year of life and only two later than from the third year of life.

Group 4 (family day care) is an almost pure day-mother group and consists of 19 children. 80% of the children had had a day-mother from their first or second year of life and for at least five years. Three exceptions should be mentioned. We have assigned three children who after four years at a day-mother spent one year at a center to this group. The reason is that the center care entered very late during the preschool period and that the family day care strongly dominated.

Group 5 (home care) is a home group with 30 children. The home care, however, has been supplemented with part-time kindergarten (3 hrs per day) for one or two years. Half the group had one year and half two years in kindergarten. Also in this group there are a few exceptions to the general pattern. Five children had spent one year at a relative or day-mother but spent six years at home and in part-time kindergarten.

Table 1. Distribution of the Five Child Care Groups on Some Background Variables. Percentages.

	Early center (n=33)	Late center (n=21)	Mixed group (n=16)	Day-mother (n=19)	Home group (n=30)
Sex of child:					
Boys	42	48	56	53	40
Girls	58	52	44	47	60
Family type:					
2 parents	61	52	62	68	83
1 parent	39	48	38	38	17
Mother's educ:					
Low	42	62	62	47	60
High	58	38	38	53	40
Occ. status:					
Blue collar	39	71	62	53	70
White collar	61	39	38	47	30
# changes in child care:					
1	39	48	0	0	40
2+	61	52	100	100	60

Note: Low education is defined as 9 years of compulsory education or less.
The blue collar category also includes low white collar workers. The parent with highest status has defined the variable.

As can be seen from the descriptions of the five groups the realities of life produced some cases with day care histories which did not fit these clearcut categories completely. Those children were placed in the categories that seemed to fit best.

The five groups differ in various background measures which is shown in Table 1 indicating that parents choose different environments including center care. Group 5, the home group, consists to more than 80% of families with two parents, while in group 2, late center care, only half of the families have two parents.

Group 1, early center care, and group 4, day-mothers, have more mothers with an education above the compulsory school than the other three groups. In group 1 the majority of families also belong to the middle class while in group 2, 5, and to some extent group 3, the mixed group, the majority is blue collar or lower white collar workers.

We have also calculated how many changes in day care the children had experienced. All children in group 3 and 4 had experienced two or more changes which is a substantially higher proportion than in the other groups.

In Table 2 we also show the intercorrelations between the predictor variables. We can see that except for the correlation between mother's educational level and family's occupational status the correlations are quite small.

Table 2. Intercorrelations Between the Various Predictor Variables.

	1.	2.	3.	4.	5.
1. Sex of child	-	-	-	-	-
2. Moth's educ.	.21	-	-	-	-
3. Family type	.18	-.24	-	-	-
4. Occ. status	.07	.51	-.22	-	-
5. # changes	.04	.14	-.04	.06	-
6. Child care (3 groups)	-.02	-.08	-.14	-.20	.12

Note. Coefficents equal to .18 or higher are significant on the 5%-level.

Instruments

The measurement of the children's development concentrates on competence, cooperation, endurance, and some other personality characteristics. With competence we mean both cognitive and social competence. The choice of concepts has to do with the basic hypotheses of the project (the FAST-project) this study is part of. The first hypothesis states that children develop through interaction with their environment and their ability to function in situations outside home is depending on the extent

parents and other grown-ups participate together with the child in common activities requiring competence, cooperation, and endurance to attain a goal (Andersson & Sandqvist, 1982).

The hypothesis also speaks of children's ability to function in situations outside home. This is based on one of the basic ideas in the ecological theory of human development developed by Bronfenbrenner (1979), namely that the developmental effects of the environment are best studied in other settings than the one in which the child has made the experiences. Therefore we have chosen to concentrate on school behaviors in this study.

The cognitive competence has been measured in two ways. Firstly, the children have been tested with two non-verbal subtest from a Swedish grouptest (Malmqvist, 1978) and two verbal subtests from the Swedish version of WISC (1979). The two non-verbal tests measure perceptual cognition (Similarities) and cognitive reasoning (Classifications) and the two verbal tests the child's vocabulary (Vocabulary) and understanding of various concepts and situations, e.g. why people are put in jail (Understanding).

By adding together scores from the subtests we have formed three summary scores - one for the non-verbal tests, one for the verbal ones and one for all four subtests (a Total score) -based on standardized scores. After the formation a new standardization was made with the mean set to 100 and the standard deviation to 15.

Secondly, the children's teachers were asked to rate their school performance in various aspects in a five point scale from "much above average" to "much below average". The following aspects were rated:

1. Reading.
    a. ability to read single words.
    b. ability to read simple texts.
2. Writing.
    a. ability to write simple sentences.
    b. ability to write simple stories.
3. Arithmetic.
    a. ability to master instructed integers.
    b. ability to do simple subtraction.
    c. ability to do simple addition.
4. General subjects.
5. Music.
6. Physical education.

Ratings 1 a-b and 2 a-b were added to a sum called "Reading and writing", ratings 3 a-c to a sum called "Arithmetic", and ratings 1-3 to a sum called "Academic achievement". In contrast to the test scores the scales are reversed which means that a low score is more positive than a high score.

The social competence as well as some other personality variables were measured by the help of a detailed questionnaire given to the teachers. In 52 items various child behaviors were described and the teachers had to state in a five point scale how well the descriptions fitted the child.

A principal factor analysis with varimax rotation was made and eight factors with 38 of the 52 items were considered meaningful and interpretable. Only items with loadings around .30 or higher were considered in interpreting the factors. In adding together the items in a factor negatively formulated items have been reversed so that a low score should be considered as more positive than a high score.

The following factors were found:

Factor 1. Persistence and independence.

34.	He can be busy a long time before he gets weary.	.82
41.	He gets weary as soon as he comes across difficulties.	-.80
47.	He can follow directions given to manage a task.	.77
14.	He can manage well on his own.	.76
22.	He often needs help to follow directions.	-.76
35.	He can manage to work from simple written directions	.73
6.	He can work concentrated for long periods with things he likes.	.73
49.	He works persistently with difficult problems.	.71
20.	He keeps his things in good order.	.64
29.	He has difficulty in finding things to do on his own.	-.59
2.	The peers often ask him for help.	.58
39.	He would like to observe how his peers do before he starts with his own tasks.	-.53

Factor 1 consists of two kinds of items - those describing the child's persistence and concentration and those describing the child's ability to manage his own and follow given instructions without help, which could be interpreted as an expression of independence. An unsuccessful attempt was made to separate these two types of items but they seem to merge in school situations.

Factor 2. Social confidence.

27.	He likes to stand before the class and tell stories.	.87
43.	He likes to participate in various forms of dramatic exercises, e.g. improvisations and role plays.	.86
7.	He likes to tell stories and fairy-tales.	.76
10.	He participates actively in class entertainments.	.75
51	He is confident and isn't afraid of answering questions.	.69
45.	He often takes own initiatives to activities.	.66

The items in Factor 2 describes behaviors where the child ventures to expose himself socially and is socially active.

Factor 3. Short temper and impulsivity.

4.	He has short temper.	.87
3.	He gets angry when I have to critize him.	.84
24.	He gets upset or angry when he is criticized.	.82
25.	He is impulsive and thoughtless.	.62
26.	It happens that one must reprimand him.	.60

Factor 3 consists of items describing a child who has difficulty in controlling himself and who can't stand criticism from the teacher. It is plausible to regard the behavior as an expression of a certain degree of aggressivity. A lov score means that the child shovs a lov degree of short temper and impulsivity.

Factor 4. Peer contacts.

40.	The peers won't let him join their games.	.80
21.	He has problems getting friends.	.77
52.	He has many friends to be together with.	-.69
28.	He is not allowed to join the peers in their work.	.62

A child with a lov score in factor 4 has easy to get friends and has many and he is accepted both in their games and work.

Factor 5. Verbal facility.

15.	It is easy to understand him vhen he speaks.	.81
30.	He speaks fluently, has a rich vocabulary and uses it correctly.	.71
37.	He has difficulty in expressing himself and find the right vords; he has a bad vocablularly.	-.64

The items in factor 5 indicates the child's ability to make himself understood and express himself by the help of the language.

Factor 6. Distractability vs attentiveness.

48.	He is often disturbing during lessons.	.73
50.	He is restless and can't sit still.	.69
16.	He can satisfactorily manage class routines and rules.	-.57

The items in factor 6 describes the child's ability to adjust to routines and rules in the school and the class and not disturb others during lessons.

Factor 7. Anxiety.

38.	He is often timid and anxious in various situations in school.	.67
19.	If he thinks a task is difficult he asks me for help.	-.64
18.	He often cries and wants to go home.	.51

Factor 7 describes whether the child is anxious or secure in the school situation. An interpretation of the negative loading for item 19 is that if a child dares to ask the teacher for help he is less anxious than if he is afraid of asking the teacher. A low score indicates security and a high score anxiety.

Factor 8. Assertiveness.

9.	He holds his own if he thinks others are wrong.	.52
20.	He is obstinate and gets his own way.	.46

Factor 8 describes how well the child can stick to his opinion and hold his own.

The variable "Transition from preschool to school" consists of six items grouped together without any preceding factor analysis. The items describe how easy or difficult the transition was. The items are:

1. He needed more time than the rest of the pupils to adjust to the time schedule and other routines in school.
2. He often cried and was afraid of doing things in school.
3. He learned quickly to recieve instructions and directions which I gave the class.
4. It took long time before he got in contact with his new peers.
5. The transition from preschool to school was easy and without any problems.
6. It took long time before he dared to stay in school without mom or dad.

Table 3 shows Cronbach's alpha coefficients for the nine social and personality scales. As can be seen they are quite high and satisfactory.

Table 3. Cronbach's Alpha Coefficents for Nine Social and Personality Scales.

1. Persistence and independence	.96
2. Confidence	.90
3. Short temper and impulsivity	.89
4. Peer contacts	.85
5. Verbal facility	.87
6. Distractability vs attentiveness	.90
7. Anxiety	.80
8. Assertivness	.70
9. Transition from preschool to school	.80

Statistical methods

As shown in Table 1 the groups differed with respect to various background variables. Middle class families, for instance, were more inclined to use day care centers even before the age of two than working class parents. This makes the analyses somewhat complicated. We need a method to control for these differences if we want to say something about the effects of day care.

I have chosen to regard the issue as a problem of prediciton. How well can the children's later development be predicted by the help of the day care variable and some other ecological variables, namely mother's level of education, occupational status of the family, family type, sex of child and number of changes in the day care arrangements. The last variable is discussed in detail in Andersson (1985).

Even if sex of child is a biological variable it can also in a sense be regarded as an ecological one. A considerable amount of studies have shown that boys and girls experience different environments and treatments (see e.g. Hägglund, 1986).

Two statistical methods have been used. In the first preliminary analyses the children were divided in three day care groups and stepwise regression analysis was used. Like most regression analyses the method requires the predictor variables to be interval scales or dummy variables. One can discuss wether the day care variable meets this requirement or not, but still with three groups one can regard the variable as a quantitative one. The children have got much experience, less experience or none expereince of day care centers.

With five day care groups the day care variable is no longer a

quantitative but a qualitative one. Another method was therefore needed. The method chosen was Multiple Classification Analysis (Andrews, Morgan, Sandqvist, & Klem, 1973) which was found extremely useful for our purpose and data. Unlike simpler forms of other multivariate methods, this technique can handle predictors with no better than nominal measurements, and interrelationships of any form among predictors or between a predictor and the dependent variable. The statistics provided by the method show how each predictor relates to the dependent variable both before and after adjusting for the effects of other predictors, and how all predictors considered together relate to the dependent variable. Simply speaking the method is a multiple regression approach using dummy variables (op. cit. p. 1f).

For those readers who are unfamiliar with this particular approach it is important to stress that it produces two kinds of means - one based on the raw score and one adjusted mean indicating what the mean would have been after controlling for the other predictors. The program also produces two kinds of correlation measures - eta, which is a nonlinear coefficient indicating the ability of the predictors to explain variation in the dependent variable, and beta, which is based on the adjusted means and provides a measure of the ability of the predictor to explain variation in the dependent variable after adjusting for the effects of all other predictors. For all predictors together are also given two multiple correlation coefficients squared - one unadjusted and one adjusted for degrees of freedom. The first one indicates the proportion of variance explained in the actual study, the second one indicates the variance explained in another but comparable set of data.

As we are especially interested in the 'independent' effects of type of day care we will concentrate our discussions on the

adjusted measures and above all on those of the day care variable.

Results

Stepwise regression

Four of the six predictors are general background variables while two of them - the type of day care variable and the change (of day care arrangements) variable - relate to families' daby care. One first question is whether these two variables have any "unique" explanatory power over and above what can be explained by the first four predictors. If that is not the case there would be no use to continue the analyses with the day care variables.

To answer this two sets of stepwise regression analyses were performed - one with four and one with six predictors. When comparing the R2's for each of the various dependent variables it is quite clear that adding information about the families' day care increases the predicitive power of the model for most dependent variables. This is true both for the cognitive variables and for many of the social-personal variables. The R2's are shown in Table 4. From now on we will use only the summary scores for test results and academic school achievement. The variables they are based on gave the same picture taken separately.

Twentytwo regression analyses with six predictor variables were performed. Only a couple of them will be reported here to show the general picture. They are presented in more detail in Andersson (1986). The analyses were made by the help of the SAS

Table 4. Comparison Between Stepwise Regression Models with Four and Six Predictors. R2-values.

Dependent variable	Four predictors	Six predictors
Non-verbal tests	.05	.07
Verbal tests	.07	.17
Total test sum	.08	.14
School achievement (sum of academic subjects)	.12	.18
Music	.10	.18
Persistence and independence	.14	.18
Social confidence	.15	.21
Short temper and impulsivity	.08	.09
Peer contacts	.09	.10
Verbal facility	.05	.14
Distractability vs attentiveness	.10	-.11
Anxiety	.07	.12
Assertiveness	.10	.16
Transition from preschool	.02	.06

program packet and the STEPWISE procedure (see SAS User's Guide, 1979 and Hocking, 1976 for further information).

The method answers the question which combination of 1, 2, 3 and so on up to six predictors can best predict the outcomes on the dependent variables. It also tells what proportion of the variance in the dependent variables that the predictor variables together can explain (R^2).

Table 5 gives the results for the total test scores and Table 6 for the verbal tests. In both analyses the day care variable enters first in the analysis and explains 6-7% of the variance. After all six steps it is still this variable which show the strongest significant contribution to the explanatory power of the model.

For the total test sum mother's education enters next in the model followed by sex of child, and for the verbal tests family type and child care changes enters the model in step two and three. For academic school achievement (Table 7) the picture is somewhat different. Now mother's education enters first in the model followed by type of child care. Child care's contribution

Table 5. Results from Stepwise Regression Analysis.
Total Testsum.

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Child care	xx	xx	xx	xx	xx	xx	.06
Moth's educ.		x	xx	x	x	•	.05
Sex of child			•	•	•	•	.02
Family type				-	-	-	.01
Changes					-	-	-
Occ. status						-	-
R^2	.06	.11	.13	.14	.14	.14	
p	.006	.002	.001	.002	.005	.01	

• p<.10, x p<.05, xx p<.01, xxx p<.001, - no significance

Table 6. Results from Stepwise Regression analysis.
Verbal Tests.

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Child care	xx	xxx	xxx	xxx	xxx	xxx	.07
Family type		x	x	x	+	+	.05
Changes			-	+	-	-	.02
Sex of child				-	-	+	.01
Moth's educ					-	-	.02
Occ.status						-	-
R^2	.07	.12	.14	.15	.17	.17	
p	.004	.001	.001	.001	.002	.003	

+ p<.10, x p<.05, xx p<.01, xxx p<.001, - no significance

to the prediction is also here significant. Usually only two or three predictors is needed to come close to the maximum of R2.

The six predictors taken together explains up to 18% of children's variance in cognitive ability. Thus, only knowing about the children's ecology one can explain almost up to one fifth of their variance in cognitive ability.

The situation is very similar for the social and personal variables. The highest proportion of explained variance is found for the variable 'Social confidence' (21%). This is shown in Table 8. As can be seen sex of child enters first in the model followed by type of child care and occupational status. All three

Table 7. Results from Stepwise Regression Analysis.
School Achievements

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Moth's educ	xxx	xxx	xx	xx	x	+	.11
Child care		x	xx	xx	xx	xx	.04
Changes			-	-	-	-	.02
Family type				-	-	-	.01
Occ status					-	-	-
Sex of child						-	-
R^2	.11	.15	.17	.18	.18	.18	
p	.0004	.0001	.0002	.0002	.0006	.001	

+ p<.10, x p<.05, xx p<.01, xxx p<.001, - no significance

variables have significant contributions to the explanatory power of the model. For "Assertiveness", "Verbal facility" (Table 9), and "Anxiety" (Table 10) the child care variable also enters first in the analyses.

To summarize, the performed stepwise regression analyses show that type of child care is an important predictor for children's later development. This is true also when various social background variables are introduced in the analyses.

The more detailed accounts of the effects of the various predictors as well as of the differences between the child care groups will be given in the next section.

Table 8. Results from Stepwise Regression Analysis.
Social Confidence

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Sex of child	xx	xx	xx	xx	xxx	xx	.08
Child care		xx	x	xx	xx	x	.06
Occ.status			x	x	xx	x	.04
Changes				+	+	+	.02
Moth's educ					-	-	.01
Familytype						-	-
R^2	.08	.14	.18	.20	.21	.21	
p	.002	.0002	.0001	.0001	.0001	.0002	

+ p<.10, x p<.05, xx p<.01, xxx p<.001, - no significance

Multiple Classification Analyses

In addition to the six ecological predictor variables mother's subjective satisfaction with her child care arrangements was included as a seventh predictor in the MCA-analyses. The variable was measured when the child was between 3 and 4 years of age. This is in accordance with the ecology of human development approach (Bronfenbrenner, 1979) in which both the objective and subjective aspects of the environment are emphasized.

The satisfaction variable turned out to have a curvilinear relationship with the dependent variables. It is therefore less

Table 9. Results from Stepwise Regression Analysis.
Verbal Facility

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Child care	xx	xx	xx	xx	xx	xx	.08
Occ.status		x	-	-	-	-	.02
Changes			-	-	-	-	.02
Family type				-	-	-	.01
Sex of child					-	-	.01
Moth's educ						-	-
R^2	.06	.10	.12	.13	.14	.14	
p	.002	.002	.002	.003	.006	.01	

+ p<.10, x p<.05, xx p<.01, xxx p<.001, - no significance

suitable for ordinary regression analyses, but the MCA-method can handle such relationships.

As in the previous analyses two sets of MCA-analyses were performed - one with four and one with seven predictors. When comparing R2's for each of the various dependent variables it is quite clear that adding information about the families' day care substantially increases the predictive power of the model for most dependent variables. This is especially true for the cognitive criteria but also the social-personal criteria were better predicted when the model included all seven predictors. This is shown in Table 11.

Table 10. Results from Stepwise Regression Analysis.
Anxiety

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Increment expl. var.
Child care	x	xx	x	x	x	x	.05
Changes		x	•	•	•	•	.03
Occ.status			-	-	-	-	.02
Sex of child				-	-	-	.01
Family type					-	-	.01
Moth's educ						-	-
R^2	.05	.08	.10	.11	.12	.12	
p	.02	.009	.008	.008	.02	.03	

• p<.10, x•p<.05, xx p<.01, xxx p<.001, - no significance

Tables 12 and 13 summarize the results of the MCA-analyses for the full model. Included in the tables are the major outcome variables and the seven predictor variables (the four individual background variables and the three variables related to day care). F-tests of the model show significant values for all cognitive measures - non-verbal tests only at the 10% level, though. For the social-personal vairables the model makes significant predictions at the 5% level or less in three cases and at the 10% level in five more cases. For one variable - short temper and impulsivity - the model can't make a significant prediciton.

The adjusted R^2's are substantially lower than the unadjusted.

Table 11. Comparison Between Predicitive Models with Four and Seven Predictors. R2-values.

Dependent variable	Four predictors	Seven predictors
Non-verbal tests	.05	.15
Verbal tests	.07	.33
Total testsum	.08	.26
School achievement (sum of academic subjects)	.12	.26
Music	.10	.20
Persistence & independence	.14	.20
Social confidence	.15	.24
Short temper & impulsivity	.08	.13
Peer contacts	.09	.14
Verbal facility	.05	.22
Distractability vs attentiveness	.10	.15
Anxiety	.07	.16
Assertiveness	.10	.17
Transition from preschool to school	.12	.17

This is due to the fact that the adjusted R2's are calculated by dividing the unadjusted R2's by a correction factor based on the number of subjects, the number of predictors, and the total number of categories within the predictors. Since the number of subjects is relatively low while the predictors and categories are numerous this results in a substantial reduction in R2's.

With this in mind we can notice that a model with almost only ecological external predictors can explain up to one third of the variance in test scores in the studied sample and one forth

in another comparable sample. It can also explain up to one forth or one sixth, respectively, of the variance in children's school performance and around the same for some of the social-personal variables. Most explained variance is found for Social confidence, Verbal facility, and Persistance and independence.

It is also noteworthy that the model used in the MCA-analyses has a greater explanation power than the model used in the stepwise regression analyses. One reason for this is probably the fact that the child care variable was extended from three to five categories. Another reason is the inclusion of a seventh predictor - mother's statisfaction with the day care arrangements. On the other hand, a comparison between the two statistical analyses show very similar result patterns concerning the relative importance of the various predictors.

The various background variables' predictive ability for cognitive development is shown in Table 12 and for social-personal development i Table 13. Even if the predicitive ability is relatively limited one must remember that we are dealing with only external factors. Before discussing the key variable in this study - the child care variable - attention will be given to the other predictive variables.

Mother's educational level shows a relatively high direct relationship (eta-value) with some of the dependent variables, e.g. school achievement, testtotal, persistence and independence, and transition from preschool to school. After controlling for the other predictors, however, the relationships are reduced quite substantially (beta-values). For one variable - assertiveness - the beta-values is much higher than the eta-value.

The family's occupational status shows a similar pattern as

mother's educational level, i.e. a reduction in beta-values compared to eta-values. Exceptions from this pattern are the beta-values for social confidence and peer contacts.

Family type shows relatively small coefficients, both eta- and beta-values. This is in part due to the fact that there are some interactions effects between family type and type of child care and this will be discussed later on.

Differences between boys and girls are found especially for some of the social-personal variables. The found relationships are not reduced after control for the other predictors. Thus girls are percieved by their teachers to be more persistent and independent than boys. They are also more social confident and assertive, which is noteworthy considering other research results. However, one should observe that the assertiveness variable in this study cannot be described as an aggressive variable. Girls are also more attentive and their transition from preschool to school was easier than for boys.

The amount of child care changes has not turned out to be especially valuable for predicting the outcomes. The beta-values for school achievement and music as well as for persistence and independence and social confidence, however, show some positive effects of having experienced more than one change in care arrangements and this is noteworthy and contrary to those advocating stability in childrens environment.

Together with type of child care the largest predicitive ability is found for mother's satisfaction with the child care arrangements. The coefficients are also very little affected by controlling for other predictors. The relationship turned out to be curvilinear, i.e. those mothers who gave the most positive ratings of their care situation had not so positive outcomes as

those who were more moderate in their ratings*.

One interpretation is that those who showed an overwhelming satisfaction had adopted an uncritical and unreflected attitude while the more moderate mothers had pondered more over their situation and found that some was good but some could be better. Still, the results indicate the importance both of type of day care for children's later development and of having a kind of day care parents are satisfied with.

Turning to type of child care it is quite clear that it plays an important role in the predictive model. It is also interesting to note that the direct relationships (eta-values) very seldom are reduced by controlling for the other predictors. Even if the child care variable does not always have the strongest relationships with the dependent variables - especially with the social-personal variables - the magnitude of its beta-values is in most cases worth to consider.

Summarizing so far, the results show that the seven predictors can explain up to one third of the variance in the cognitive measures and up to one forth of the variance in the social-personal measures in the studied sample. The highest independent

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* The eta- and beta-values for mother's statisfaction are somewhat overestimated. This is due to a special feature of the MCA-technique. The method allows inclusion of missing values as a certain category instead of dropping the subjects from the whole analysis. There were seven such missing values for this variable and they turned out to have constantly better mean values on the dependent variables than the other categories of this variable. This fact will result in higher coefficients than if the missing values had been dropped.

Table 12. Summary of MCA-Analyses for Cognitive Criteria. F- and R2-Values for the Whole Model and Eta- and Beta-Values for Each Predictor.

Predictor	Nonverb. eta	Nonverb. beta	Verbal eta	Verbal beta	Testtot. eta	Testtot. beta	Sch.ach. eta	Sch.ach. beta	Music eta	Music beta
Moth's educ.	.19	.18	.17	.07	.23	.15	.36	.16	.15	.02
Family type	.01	.11	.16	.12	.09	.01	.12	.15	.07	.19
Occ. status	.15	.05	.15	.02	.19	.05	.27	.10	.12	.03
Sex of child	.03	.09	.13	.18	.10	.17	.10	.02	.27	.32
# changes	.08	.03	.11	.12	.03	.07	.14	.17	.21	.19
Child care	.24	.18	.35	.35	.29	.25	.33	.30	.21	.27
Moth's satisf	.27	.24	.38	.39	.38	.36	.25	.22	.09	.13
R2ojust		.15		.33		.26		.26		.20
R2just		.05		.24		.17		.16		.10
F		p≤.10		p≤.01		p≤.01		p≤.01		p≤.05

predictive power seems to be concentrated to type of child care and mother's satisfaction with that care.

We now turn to a more detailed inspection of the means for the various child care groups.

A first step in the analyses was to perform one-way ANOVA's and t-tests on the raw scores. No significant differences at all were found for the variables Short temper & impulsivity, Peer contacts, and Distractability vs attentiveness. Although this is an interesting result in itself more attention will not be paid to these means in this section.

Table 13. Summary of MCA-Analyses for Social and Personality Criteria. F- and R2-Values and Eta- and -Beta-Values.

Predictor	Persist. & indep. eta	beta	Social confid. eta	beta	Sh.temp. & impul. eta	beta	Peer contacts eta	beta	Verbal facility eta	beta
Moth's educ	.27	.07	.13	.16	.20	.12	.23	.09	.15	.06
Family type	.02	.00	.07	.04	.19	.17	.01	.05	.09	.13
Occ. status	.25	.15	.25	.27	.12	.02	.27	.21	.21	.14
Sex of child	.28	.25	.29	.28	.11	.14	.01	.05	.06	.10
# changes	.17	.18	.14	.17	.04	.00	.10	.09	.11	.13
Child care	.20	.15	.26	.21	.12	.16	.16	.07	.34	.31
Moth's satisf	.16	.14	.18	.17	.20	.19	.23	.21	.29	.22
R2unadj	.20		.24		.13		.14		.22	
R2adjust	.10		.14		.02		.03		.12	
F	ps.05		ps.01		n.s.		ps.10		ps.05	

Predictor	Distr. vs att. eta	beta	Anxiety eta	beta	Asser-tiveness eta	beta	Transition presch»school eta	beta
Moth's educ	.16	.08	.17	.03	.13	.28	.27	.08
Family type	.08	.13	.08	.08	.23	.12	.01	.01
Occ. status	.08	.02	.20	.11	.01	.09	.27	.17
Sex of child	.28	.32	.15	.13	.18	.20	.21	.17
# changes	.08	.02	.15	.12	.10	.11	.10	.09
Child care	.13	.19	.31	.24	.23	.23	.22	.15
Moth's satisf	.10	.15	.16	.14	.08	.10	.16	.13
R2unadj	.15		.16		.17		.17	
R2adjust	.04		.06		.07		.06	
F	ps.10		ps.10		ps.10		ps.10	

In Figure 1 is shown the results in the cognitive measures. Dotted lines represent means based on raw scores and solid lines the adjusted means after correction for all the other predictors. In the figure is also shown the results of significant tests based on the raw scores. Observe that the scale in the teacher ratings (school achievement) is reversed, which means that low values indicates good achievement.

A striking result is that the adjusted means differ very little from the unadjusted. That means that the differences found between various day care groups cannot be explained by their different distributions in the other predictor variables.

Another striking result is the superiority shown by children in the early center group over children in the other groups, especially on the total testsum and school achievement. The differences between the other groups on those two measures are small and insignificant. The only change of interest after adjusting the means is the change in rank order between the home group and the day-mother group.

The ANOVA for non-verbal tests did not reach significant F-values, even if t-tests show individual significant differences. Best results show the two day care groups, significantly better than the mixed group, which had the lowest mean score.

For the verbal tests the picture is different. Here it is the children in the early center group and the mixed group who perform best while the other three groups perform well below the total mean. I will return to these results in the discussion section.

The reader can also note a slow continous decrease in music performance as rated by the teachers from early center care to

home care. Between these two groups the difference was statistically significant at the 5%-level.

In Figure 2 are shown the mean values for the six social-personal variables for which any significant difference in raw scores were found. The general picture is about the same as for the cognitive variables. Most positive ratings are given to children in the early center group. The ANOVA's produced significant F-values for only three of the variables, but the trend is so striking and similar that I think one is safe to discuss the general pattern instead of just individual significances.

Doing so one can state that in this study school teachers describe children who started very early at day care centers and spent six-seven years there as more socially confident, less anxious in the school situation, more persistent, concentrated and independent and more assertive than children in other groups. They also had a better ability to express themselves and make themselves understood and the transition to school was easier and less problematic.

A few differences between the other groups were found. Children in the mixed group were rated rather low on the anxiety scale which could be a result of the fact that they also entered public day care (day mother) early and got used to change care settings by later change to center care.

The home group is rated significantly worse on the Verbal facility scale than most other groups. It can be explained with the less need these children have to express themselves clearly and understandably since both children and parents have learned to interpret each other without much verbal elaboration.

The means for the day-mother group are not significantly different from any of the other groups with the just mentioned exception. The means, however, are very close to those of the mixed group, especially after correction for the other predictors and the general trend is that there exist a difference between the early center group and the day-mother group.

Like ordinary regression analyses the MCA-technique assumes additive effects but offers a simple way to study interaction effects should they be present. To see if we had any interaction effects to deal with a number of two-way ANOVA's were run. For each combination of the day care variable and the other predictor variables taken one at a time ANOVA's were performed for every dependent variable.

Significant interaction effects were very few in number and mainly concentrated to the family type variable and only for some of the social-personal variables. If we replace the day care and family type variables with a combined variable based on these two and repeat the MCA-runs the prediction power for the complete model increases with about 8-9% for the unadjusted R2's and 5-6% for the adjusted. At the same time the beta-values for the interaction variable become substantially higher than for each of the two original variables.

The adjusted means for one- and two parent families for each child care group are shown in Table 7. One must, of course, interpret individual mean values with great caution since n's are very small in some groups. If we try to find a general trend, however, one interpretation would be that it is of great importance for families with just one parent in the household to supplement the stimulation the home can offer with other kinds of stimulation - in this case both center care and family day

care seem to do.

Table 14. Interactions Between Family Type and Type of Child Care. Adjusted Means.

Predictor	Family type	Early care	Late care	Mixed	Day-mother	Home care
Persistence & independence	1 par.	23.63	24.99	29.98	23.66	42.17
	2 pars.	25.07	29.78	28.72	30.75	25.67
Peer contacts	1 par.	6.12	5.74	7.30	5.24	9.58
	2 pars.	6.83	7.35	5.97	7.70	6.64
Verbal facility	1 par.	4.43	4.57	5.93	5.74	10.28
	2 pars.	4.54	5.26	5.24	5.06	5.86
Distractab.ve attentiveness	1 par.	5.54	5.30	5.84	3.94	8.56
	2 pars.	5.89	3.72	3.83	5.69	4.69
Anxiety	1 par.	3.63	4.67	3.75	3.93	7.50
	2 pars.	4.30	5.28	4.90	5.24	5.07
Transition from preschool to school	1 par.	9.24	10.45	11.30	7.75	15.52
	2 pars.	9.64	11.16	10.98	11.72	10.36
Number of subjects	1 par.	13	9	6	7	5
	2 pars.	20	10	9	13	24

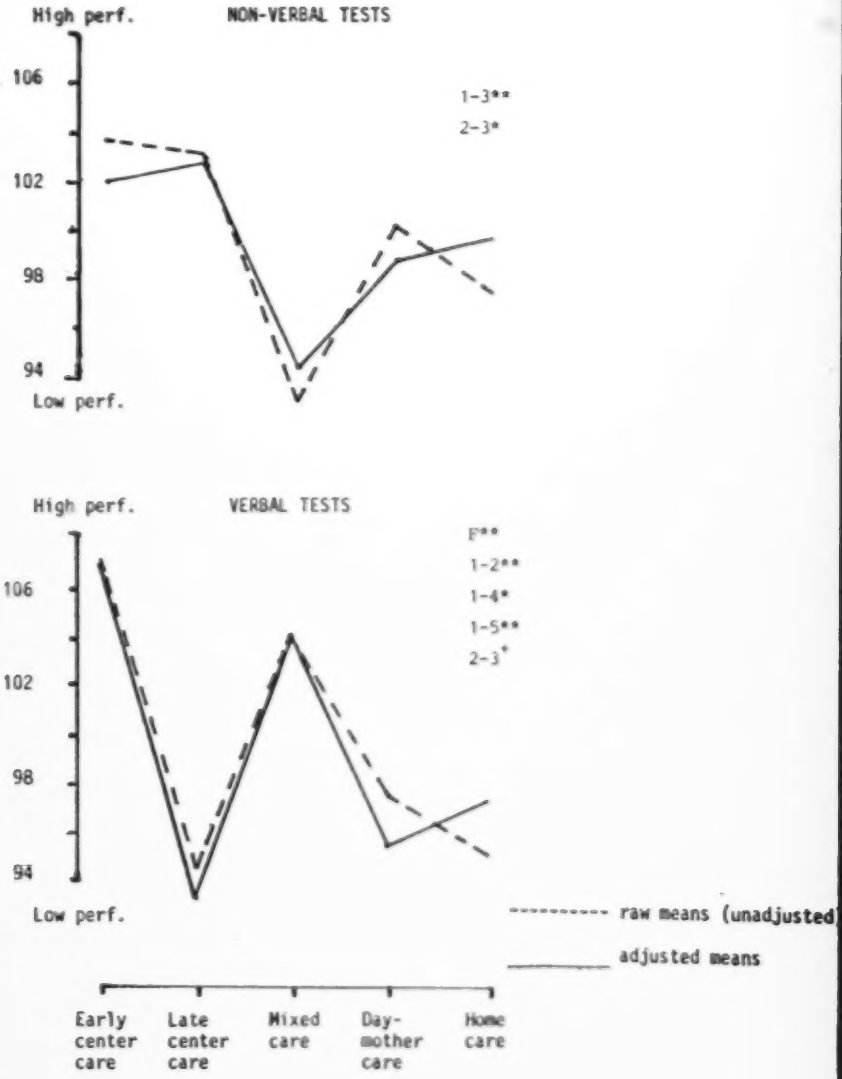
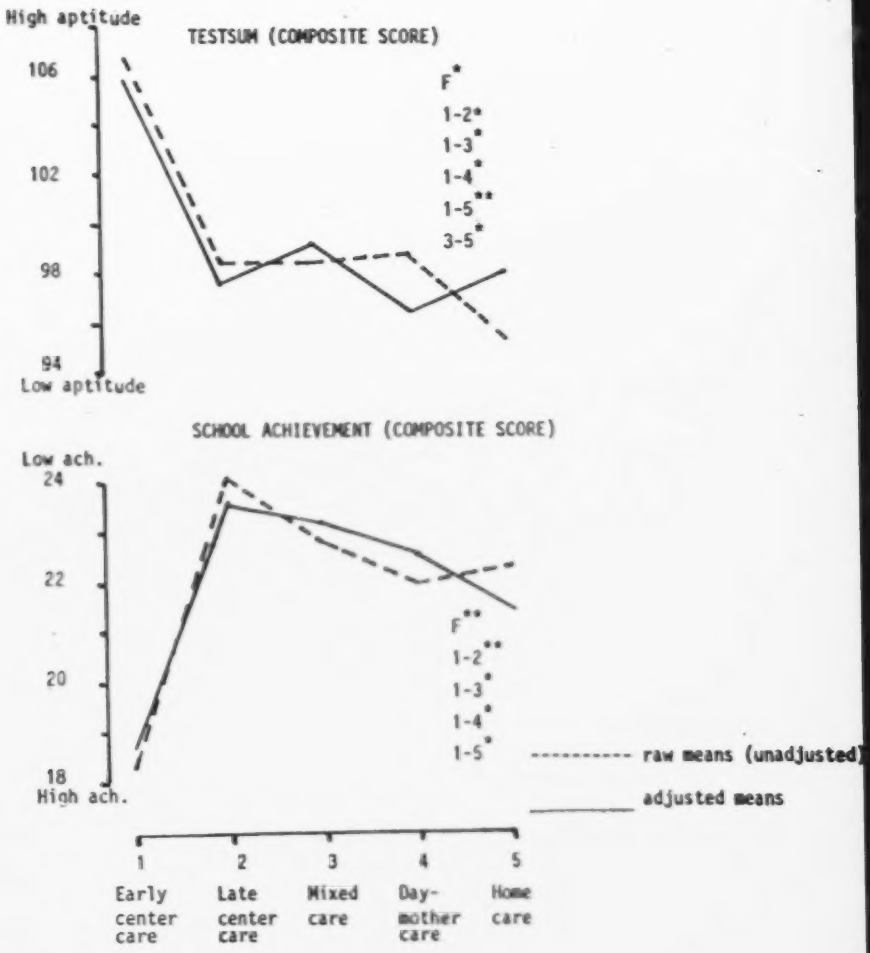


Figure 1. Unajdusted and adjusted means on the cognitive measures.



F= results of one way ANOVA on raw means.

\+ $p \leq .10$
* $p \leq .05$ } t-test between raw means.
** $p \leq .01$

Figure 1 (continued)

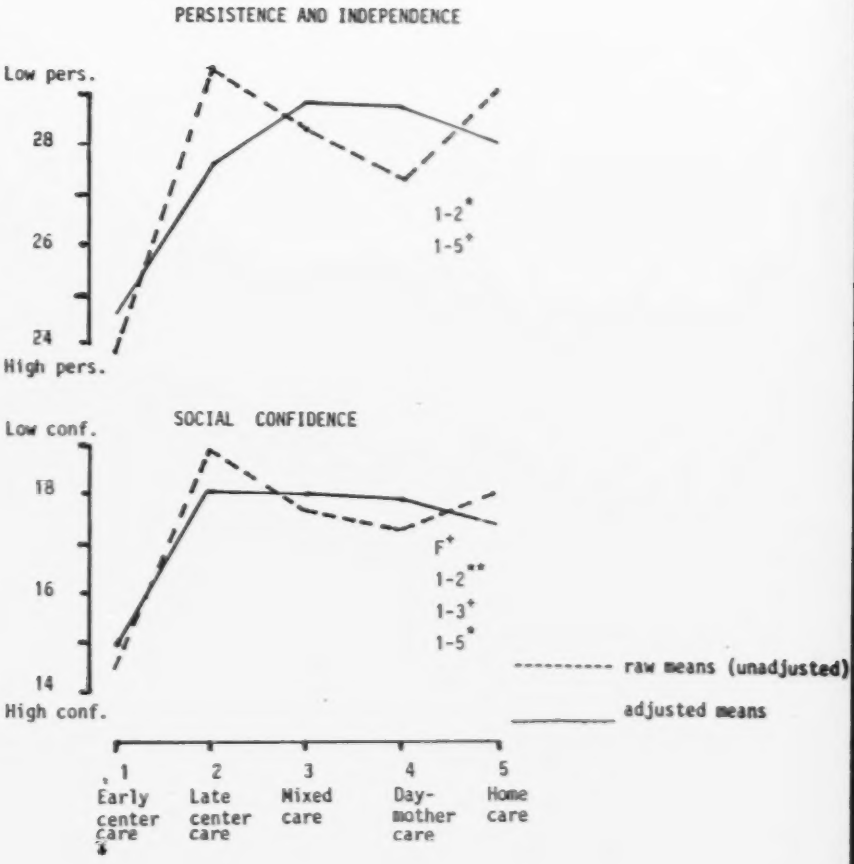


Figure 2. Unadjusted and adjusted means on the social-personal measures.

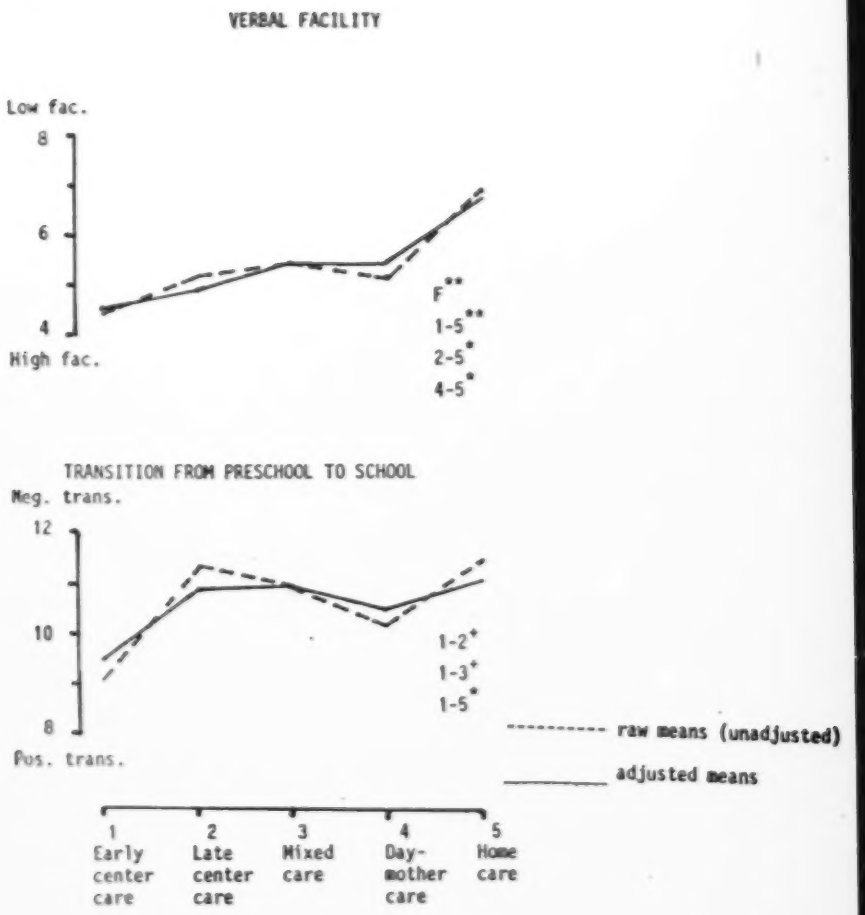


Figure 2 (continued)

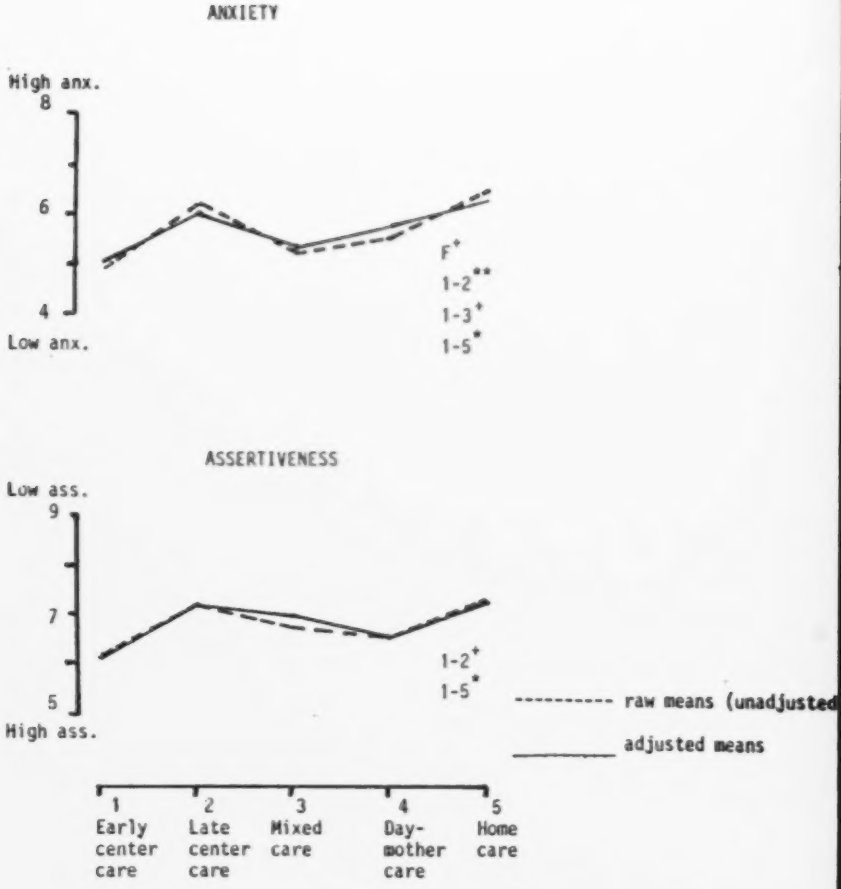


Figure 2 (continued)

F= results of one way ANOVA on raw means.

+ $p \leq .10$
* $p \leq .05$
**$p \leq .01$

t-test between raw means.

Discussion

119 children have been followed from infancy up to age 8. They were divided into three or five groups respectively with regard to the kind of child care they have had during the preschool period. At age 8 they were tested with aptitude tests and their school teachers rated their school performance and their social and personal development. The relationship between type of child care and later development has been studied by the help of stepwise regression analysis and multiple classification analysis controlling for several background factors.

The results seem quite clear-cut and the results from the two kinds of analyses support each other. The children in the early center group achieve significantly better on the aptitude tests and get more positive ratings from their teachers in most rating aspects - school achivements as well as social-personal attributes - than children in the other groups. The differences between the other four groups, on the other hand, are quite small and insignificant. These latter results seem to be in accordance with previous research where differences between children in various forms of child care have been very few in number. The first result, however, is contrary to what many child experts consider as an established truth and we must therefore carefully discuss possible interpretations of them.

A problem in ecological field research is to find comparable investigation groups. In a planned experiment one can randomly assign subjects to various groups, but this is not possible in this kind of study. Another method would be to match the subjects in the various investigation grooups with respect to important background variables. Even if that method had been possible in this study - which it is not due to the longitudinal character of the study and the limited number of subjects - it

is not a method without problems and drawbacks. Imagine a situation where most middle class parents choose to place their children in center care while most working class parents prefer to keep their children at home. No doubt it still would be possible to form two investigations groups with the same proportion of white and blue collar families sending their children to a day care center or keeping them at home. But comparable as they may seem they would be very irrepresentative of the real situation. We would learn something about middle class children in center care and working class children in home care, but very little about middle class children in home care and working class children in center care, since we don't know how ordinary middle class children would develop in home care and vice versa. The more background variables we tried to take into consideration in the matching procedure, the more biased and irrepresentative of the normal situation would the groups be. Thus choosing a matching procedure should be done with some discretion.

The only method available in this study was to use statistical techniques and by their help adjust for inequalities in background variables between the various investigation groups. This can be done in many ways. Since this is a longitudinal study of development I have chosen to approach the research problem as a question of prediction. Among the predictors our strategic variable - the day care variable - is just one of several predictors. This may be seen as a somewhat untraditional way to handle the problem, but in my opinion it has turned out to be quite effective.

The analyses show both that the variables related to child care increase the predictive power of the model and have predicitive power even after adjusting for the child care groups' varying distributions in the background variables. Thus it can be argued

that the groups have been made comparable with regard to the background variables included in the study.

But all variables concern external conditions. They say very little, if anything, about the psychological conditions prevailing in various groups. Are the groups comparable also in such aspects? Propably not!

To make the decision to stay home instead of working and take care of the child for the seven first years, when most mothers in the Swedish society work and leave their children to others, must probably mean another view of the needs of the child and other attitudes and values towards upbringing than if you choose to start to work again as soon as possible after delivery. These differences and values are very difficult to control for. We must accept that parents are different and have different values and that it in this sense are other parents who stay home and take care of their children than who work.

The important thing, however, may be if they have the kind of day care arrangements they wish to have. We have tried to control for this by including a measure of mother's subjective satisfaction with the day care arrangements. When this variable was entered into the model its predictive power increased and the variable turned out to be the most important one together with the day care variable. If parents are satisfied with their care arrangements they may feel more secure and confident in their parental role and may offer their children more stimulation and better emotional relations also in the home situation.

Another interpretation is that parents' satisfaction may also be a real indication of the quality of the care.

Since it was children in the early center group who obtained the most favorable scores on the developmental measures one may ask if their parents in various aspects are more "effective" as parents when together with their children and in that way compensate for the less time they have together. We cannot tell from this study, but we have possibilities to check with other data we have collected about the same group. We have, for instance, data about the child-parent interaction and such a check will be done in future analyses.

Another question immediately follows and that is this one. Suppose these parents turn out to be more effective; is that because they have a good child care allowing them to work and develop also in other roles than the parental one, or did they were more effective already from the beginning?

A variable that often turns out to be of importance is parents' involvement in their child and its situation. We have collected data on parents' contact both with preschool and school, which could be seen as an index of involvement, and in future analyses we will check if early center children have parents with greater involvement than other children have.

Let us, however, for the time being accept that the differences found are real and not only a consequence of differences between the groups in other variables than those I have studied. A question then is why early placement at centers is so favorable when many child psychologists and psychiatrists regard it as damaging. Can it be that the study has emphasized too much the cognitive and social aspects of development and neglected the emotional part? Is it possible that young children can profit cognitively and socially from being in more than one environment if it is a stimulating and educational setting and still be emotionally disturbed. Cognitive, social, and emotional

development are just three aspects of the total personality. It is hard to imagine that two aspects of this totality could develop extremely positive and be completely unaffected of a negative development in the third aspect. Besides there are some indications from the teacher ratings showing that the children in the early center group when 8 years old were emotionally secure and confident and showed examples of persistence, concentration and independence as well as the courage to hold their own - all behaviors which it is very difficult to believe emotionally disturbed persons would show proof of.

An alternative interpretation would be that placement at a day care center or in family day care is not a real separation for the child in the sense originally conceived of and therefore does not cause that kind of disturbance psychoanalytically oriented psychologists would expect. Instead early day care can offer a stimulating environment from which the children can profit both cognitively, socially, and emotionally.

There are some results which diverge from the general pattern. One is the performance of the mixed group on the verbal and non-verbal tests. The group performed as well as the early center group on the verbal tests but very badly on the non-verbal tests. During the last decade we have learned a lot about the importance of early verbal stimulation. If the child very early gets additional stimulation from other persons than the parents, which may be the case in both groups, that can explain the positive verbal development. But why do we not get the same results for the day-mother group, then? The children in this group got the same kind of extra stimulation in the early years. One explanation would be that in order to keep the initial gains you need an environment that can offer continuous stimulation in addition to that offered in the homes. Maybe family day care after a while becomes to similar too the home setting to offer a

real supplement.

But how can we explain the poor achievement in nonverbal tests for the mixed group? On these tests children in both early and late center care performed very well. A possible explanation to this is that activities in day care centers may stimulate the kinds of perceptual and logical thinking the tests measure. The reason why the mixed group did not perform well may be that the change from day-mother to a center after first having to adjust to a day-mother took so much psychic effort that the children could not profit from the activities in the centers. In support of this interpretation is the fact that experiencing more than one change in care arrangements, which for most variables had a slightly positive effect, did not had this effect for the non-verbal tests.

It is also interesting that we did not find any differences in three social-personal variables at all, namely "Short temper and impulsivity", "Distractability vs attentiveness", and "Peer contacts". It is true that in absolute figures there is a difference in the first variable between early center care on the one hand and especially late center care and mixed care on the other. But these differences in raw values are not statistically significant. It is thus a very meager support for the conclusions drawn by Bronfenbrenner (1979), Belsky and Steinberg (1978) and others that center children become somewhat more aggressive than other children. One explanation for the lack of difference in "Peer contacts" could be that all children in the Swedish sample have had some kind of group experience and training before school-start.

One question arises and that is whether it is the combination of center care and of early placement in public day care with the stimulation this may give rise to that explains the superiority

of the early center group or if the early stimulation in itself is the crucial variable. The mixed group and the day-mother group both contain a majority of children who entered public day care - in this case family day care - very early. If early entrance and stimulation is the important thing one would expect these groups to perform almost as well as the early center group, but they do not. However there are tendencies in this direction on some variables, for instance the mixed group's result on verbal tests, and we have therefore made a special analysis to check the importance of early stimulation in itself. The children were divided into two groups, one with entrance into public day care during their first or second year of life and the other with later entrance. A new set of MCA-analyses were then performed with the day care variable replaced by the new time variable.

The question is whether a model with the time variable predicts the outcomes in the dependent variables better than a model with the day care variable. In comparing the two models one must, however, remember that the day care variable in itself include part of the time aspect, since all children in the early center group belong to the early time category and all children in the late center group and the home group belong to the late category.

When comparing the two sets of unadjusted R^2's they are somewhat higher for the model with type of day care than for the other model. The greatest differences are found for the cognitive variables - between 4% and 7% in explained variance. The differences between adusted R^2's are somewhat less. If we compare the eta- and beta-values we will find that they also are higher for the day care variable than for the time variable.

The differences in the models' predictive power for the social-

personal variables are as a rule less than for the cognitive variables. If we also take into consideration the size of the eta- and beta-values a model including the child care variable should be prefered in six cases, while for two variables - Peer contact and Transition from preschool to school - the models seem equivalent. For the Anxiety variable the model with time as a predictor seems to be somewhat better. That means that in these three cases it is not so much the type of day care as the early entrance that covariates with better ratings from the school teachers.

If it would have been possible we should have tested a model including both time and type of care. However, this is impossible on logical grounds. MCA calculates adjusted values which show what the results would have been if each category of a predictor had the distribution of other predictors as in the total sample. But it is logically impossible that "early center care" can have any cases with late entrance to public child care. "Late center care" and "home care" can, on the same ground, not have any cases in the early entrance category. However, our conclusion is that it is the combination of the stimulation offered by an early placement in child care and the choice of center care that is of crucial importance in explaining our results so far.

Among other variables of importance I would especially like to emphasize the mother's satisfaction with the kind of daycare the family has. The strong predicitive power of this variable shows how important it is that society offers the parents a good public child care which they are satisfied with. The parents' views should be taken seriously. If that is the case they do not need to have bad conscience for leaving their child to somebody else, they can feel more secure and calmer and they can therefore when together with the child interact in a more

relaxed way. In that way they can be more effective in their parental role and better stimulate the development of their child.

Mother's educational level and family's occupational status are variables often used in this kind of research. It is interesting to note that although the variables had first-order correlations with the outcome measures these relationships substantially decreased when the day care variables were introduced into the analyses. Of course, this does not mean that they are of no importance for children's development, but their effects are indirect. Parents with different educational and socio-economic backgrounds choose different environments for their children and thereby influence indirectly what kind of activities, roles, and social relations the children will have.

Has the study proved that early day care and especially center care is good for all children? Should one strive to give every young child a place at a center? Of course not! Children are individuals and what is good for one is not always good for another. But the study has shown that center care of good quality given in ordinary centers during children's first or second year of life does not have to be detrimental as many critics maintain. On the contrary can children with early center experience develop very positively - even more favorably than children with other kinds of care experience. For some children even other kinds of early care could be positive. The importance of parents' own subjective feelings - their satisfaction and dissatisfaction has also been highlighted. It is therefore important that attention is paid to parents'own opinions. They should have the possibility of a real choice.

An overarching goal in the ecology of human development approach is to go behind the variables sociologists use when they talk

about e.g. socio-economic classes or what Bronfenbrenner (1979) calls social addresses. I think this study represents a step in this direction. However many questions remains to be answered. E.g. what if anything in the center setting makes it so stimulating for just young children? What kind of acctivities, roles, and social relations develop there and in what way do they differ from the activities, roles, and social relations in day-mothers' homes or in the homes of the children?

References

Andersson, B-E. (1985) Familjerna och barnomsorgen. En rapport från FAST-projektet. Rapport från Institutionen för pedagogik, Högskolan för lärarutbildning i Stockholm, 5, 1985.

Andersson, B-E. (1986) Hemma eller på dagis. Rapport från Institutionen för pedagogik, Högskolan för lärarutbildning i Stockholm, 1986.

Andersson, B-E. & Rydén, L. (1979) Urvalet av bostadsområden inom FAST-projektet. Rapport från Institutionen för pedagogik, Högskolan för lärarutbildning i Stockholm, 2, 1979.

Andersson, B-E. & Sandqvist, K. (1982) Family support and development. A presentation of a Swedish longitudinal research project of families with small children. Reports on Education and Psychology, Department of Educational Research, Stockholm Institute of Education, 2, 1982.

Andrews, F.M ., Morgan, J.N., Sonqvist, J.A., & Klem, L. (1973) Multiple classification analysis. Ann Arbor: University of Michigan, Institue for Social Research.

Belsky, J.& Steinberg, L. (1978) The effects of day-care:A critical review. Child Development, 49,929-949.

Bronfenbrenner, U. (1976) Research on the effects of day-care and child development. In Toward a national policy for children and families. Washington, D.C.: National Academy of Sciences, Advisory Committee on Dhild Development.

Bonfenbrenner, U.(1979) The ecology of human development.

Experiments by nature and design. Cambridge, Mass: Harvard University Press.

Cochran, M. & Gunnarsson, L. (1984) A longitudinal study of group day care and family child-rearing patterns: First follow-up. Journal of Marriage and the Family.

Gunnarsson, L. (1978) Children in day care and family care in Sweden: A follow-up. Research and Bulletin, Department of Educational research, University of Gothenburg, No. 21.

Haskins. R. (1985) Public school aggression among children with varying day-care experience. Child Development, 56, 689-703.

Hocking, R.R. (1976) The analysis and selection of variables in linear regression. Biometrics, 32, 1-50.

Hårsman, I. (1975) The emotional and social adjustment of infants to day care centers. Paper presented at the International Conference on Infant Studies, Arpil 5-8.

Hårsman, I. (manus) Spädbarn på daghem och hemma - en studie av anpassningsprocessen, interaktionen vårdare-barn och attachementbeteendet. Institutionen för pedagogik, Högskolan för lärarutbildning i Stockholm.

Hägglund, S. (1986) Sex-typing and development in an ecological perspective. Göteborgs studies in educational sciences, 55. Göteborg: Acta Universitatis Gothoburgensis.

Malmqvist, E. (1978) Anvisningar och normer för Gruppteet för Intelligens- och Mognadsundersökning i årskurs 1 i grundskolan. Linköping.

Moore, T.W. (1975) Exclusive early mothering and its alternatives: The outcome to adolescence. Scandinavian Journal of Psychology, 16, 255-272.

OSIRIS (1979) OSIRIS IV User's manual. ISR, University of Michigan.

Rutter, M. (1981) social-emotional consequences of day care for preschool children. American Journal of Ortopsychiatry, 51, 4-28.

SAS (1979) SAS User's Guide. SAS Institute Inc. Raleigh, North Carolina.

WISC (1979) Wechsler Intelligence Scale for Children. Stockholm: Psykologiförlaget.